

# PATENT SPECIFICATION

DRAWINGS ATTACHED

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## COMPLETE SPECIFICATION

### Improvements in and relating to Thrust-Roller Bearings

We, WILHELM SCHAEFFLER and GEORG SCHAEFFLER, both of German nationality, and both of 3 am Sportplatz Weiherbach, Herzogenaurach, near Nürnberg, Germany, trading as INDUSTRIEWERK SCHAEFFLER OHG, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

Steering swivel joints are used to provide a steerable mounting for the front wheel of vehicles. It is known to use plain bearings for this purpose. The tendency in automobile engineering is, however, towards eliminating the need for maintenance of such bearings. Although it is possible to design plain bearings in such a way as not to need maintenance over a fairly long period, this can only be done at the expense of their load-carrying capacity. It has, therefore, been proposed that the plain bearings for the mounting of the steering knuckle arms should be replaced by roller bearings. Such roller bearings can be lubricated once and for all to provide lubrication for their whole service life with no adverse effect on their load-carrying capacity. Roller bearings have the further advantage that, in contrast to plain bearings, it is not necessary at the beginning of each steering movement to overcome static friction which is greater than the subsequent friction during movement.

It has been shown, however, that roller bearings transmit shocks, originating from the road to the steering gear without any damping action. In the case of especially uneven road surfaces these shocks can build up into vibrations, which can have an exceptionally adverse effect on the road behaviour of the vehicle, especially at high speeds. In order to avoid these adverse effects, attempts have

been made to combine roller bearings with a plain bearing. This does not, however, enable the need for maintenance to be completely eliminated, owing to the presence of the plain bearing.

In order to obtain an adequate measure of damping with roller thrust bearings used for the mounting of steering swivelling stub axles on vehicles, there is provided according to this invention a thrust bearing for use in the mounting of swivelling stub axles on power-driven vehicles, consisting of two discs between which are arranged a number of rollers housed in a cage, wherein the longitudinal axes of at least some of said rollers are inclined to radial lines passing through the respective rollers so that extensions of said longitudinal axes cross the axis of rotation of the bearing without intersecting said axis whereby a driving connection is obtained between said discs.

In the thrust bearing according to the invention, the angle by which the axes of the rollers deviate from the radial direction is advantageously smaller than the angle at which a non-slip driving connection would be established between the two working discs under the action of the normal thrust load acting on the bearing. The oblique disposition of the rollers within the given limits thus has a damping effect, which damps to a sufficient extent the shocks arising from the uneven road surface and at once suppresses any vibration that may be caused by a particularly uneven road surface.

Two preferred embodiments of the invention will now be described by way of example with reference to the accompanying drawing which is a diagrammatic side elevation.

Referring to the upper half of the drawing, a cage 1 has, distributed over its circumference pockets 2 to receive rollers 3. Some

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of these rollers 3 have their longitudinal axes orientated in a direction, e.g. direction 4, which deviates from the radial direction, e.g. direction 6, by an angle, e.g. angle 5.

- 5 It is also possible, however, as shown in the lower half of the drawing to arrange some of the pockets for the reception of the rollers so that of the deviating axes, alternate axes deviate from the radial direction in the opposite sense.

- 10 In all the embodiments referred to above, the rollers contained in the pockets which have longitudinal axes deviating from the radial direction will be disposed so that extensions of their longitudinal axes cross the
- 15 axis of the rotation of the bearing without intersecting the said axis.

#### WHAT WE CLAIM IS:—

1. A thrust bearing for use in the mounting of swivelling stub axles on power-driven vehicles, consisting of two discs between which are arranged a number of rollers housed in a cage, wherein the longitudinal axes of at least some of said rollers are inclined to radial lines passing through the respective rollers so that extensions of said longitudinal axes cross the axis of rotation of the bearing without intersecting said axis whereby a driving connection is obtained between said discs.
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- 25

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1 SHEET

*This drawing is a reproduction of  
the Original on a reduced scale*

